

### **Remarks**

Applicant respectfully traverses each of the rejections presented in the final Office Action. The § 103(a) rejection of claims 1-5 over the Sugiura '686 reference cannot be maintained because the Examiner's proposed modification changes the principal of operation of Sugiura. The § 112(1) rejection of claims 3-4 cannot be maintained because the Examiner fails to establish that Applicant's disclosure does not comply with the written description requirement. The § 112(2) rejection of claim 5 cannot stand because the Examiner fails to present any support for the assertion that claim 5 is indefinite. Notwithstanding, Applicant has proposed minor amendments to claim 1 for clarification purposes as indicated on page 7 of this paper. The following discussion particularly addresses the failure of each of the rejections presented in the final Office Action.

Applicant respectfully traverses the § 103(a) rejections of claims 1-5 because the Examiner's proposed modification of the Sugiura reference changes the principal of operation of Sugiura. According to M.P.E.P. § 2143.01(VI), "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." In this instance, the Examiner asserts that it would have been obvious to the skilled artisan to use Sugiura's trench structure as a trench isolation structure. However, the Sugiura reference is directed to a dynamic semiconductor memory device that uses a trench capacitor as a capacitor element constitution in a memory cell. *See, e.g.,* Figure 1, Col. 1:7-10, Col. 3:20-35, and Col. 5:32-36. For example, Sugiura teaches that the electrode 15 formed in the trench 12 is capacitively coupled to the lower region 11B of the semiconductor substrate 11 and that insulator 13 is the capacitor insulating film. Figure 1 and Col. 3:28-35. The Examiner proposes to modify Sugiura such that the trench capacitor memory cell (*i.e.*, an active element) is a trench isolation structure (*i.e.*, a passive element). As such, Applicant submits there would be no motivation for the skilled artisan to make such a modification because it would change the principle of operation of Sugiura's trench capacitor memory cell. Accordingly, the § 103(a) rejection of claims 1-5 is improper and Applicant requests that it be withdrawn.

Applicant further traverses the § 103(a) rejection because the Examiner has improperly interpreted Applicant's claims in attempting to assert correspondence between the cited portions of the Sugiura reference and numerous aspects of the claimed invention. According to M.P.E.P. § 2111, the USPTO determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of Applicant's specification as it would be interpreted by one of ordinary skill in the art. In this instance, Applicant submits that the Examiner has interpreted Applicant's claims in a manner that is broader than the broadest reasonable construction by the skilled artisan in light of Applicant's specification. The following discussion particularly addresses these issues with reference to specific claim limitations.

As a first example, regarding claim 2, the cited portions of the Sugiura reference do not correspond to aspects of the claimed invention directed to the thickness of the first insulating material in the first part of the trench groove being larger than the thickness of the first insulating material in the third part of the trench groove, which is above the first part. Claim 2 requires that there be first insulating material in the third part of the trench groove as would be readily apparent to the skilled artisan. Irrespective of the Examiner's continued assertion that zero corresponds to a thickness, the cited portions of Sugiura do not teach a liner/layer of insulating material on the portion of the wall of trench 12 that is above oxide film 14 as required by the claim limitations. The Examiner asserts that the thickness of the liner/layer of insulating material on the walls of trench 12 above oxide film 14 has "zero thickness". Applicant agrees with the Examiner's interpretation that the cited portions of the Sugiura reference do not teach any insulator above the silicon oxide film 14. As such, there is no correspondence between the claim limitations which require that there be first insulating material in the third part of the trench groove, which is above the first part.

As a second example, regarding claim 3, the cited portions of the Sugiura reference do not correspond to aspects of the claimed invention directed to the first part of the trench groove being completely filled with the first insulating material. The Examiner improperly bases the rejection on the assertion that the thick part of oxide film 14 is completely filled with the first insulating material. However, claim 3 requires that

the first insulating material completely fill the first part of the trench groove (*i.e.*, the part of trench 12 that is substantially in line with the upper and lower surfaces of n-buried layer 18). Figure 1 of Sugiura clearly shows that this part of trench 12 is filled with an electrode 15. More specifically, there is no portion of trench 12 that is completely filled with the first insulating material (asserted to be oxide layer 14). *See, e.g.*, Figures 1 and 2.

In view of the above, the § 103(a) rejection is improper and Applicant requests that it be withdrawn. Notwithstanding the above, in an effort to facilitate prosecution and to avoid an appeal, Applicant has made a minor amendment to claim 1 to recite that the thicker part of the liner is substantially in line with the upper and lower surfaces of the buried layer. Applicant submits that this amendment is consistent with the intended scope of the claims as has been previously argued by Applicant and that it is consistent with the how the skilled artisan would interpret claim 1 in view of Applicant's specification (*see, e.g.*, Paragraphs 0010, 0017, and 0076 of Applicant's disclosure). Thus, Applicant respectfully requests that the Examiner enter this amendment.

Applicant respectfully traverses the § 112(1) rejection of claims 3-4 because the subject matter of these claims is fully supported by Applicant's specification. Applicant submits that support for claim limitations directed to the first part of the trench groove being completely filled with the first insulating material can be found, for example, in Paragraph 0016 of Applicant's specification. More specifically, Paragraph 0016 states that the first part can be completely filled with the first insulating material, which means that only first insulating material is present in a cross-section taken through the first part of the trench groove in a plane parallel with the plane of the buried layer. Regarding the Examiner's assertion that claim 1 reads on the embodiment of Figure 6, Applicant submits that claim 1 is a generic claim that covers more than simply the embodiment of Figure 6.

In response to the Examiner's request that Applicant point out which elements in Figures 1 and 2 read on certain limitations (*see* the Response to Arguments section of the instance Office Action), Applicant submits that any correspondence between these limitations and Figures 1 and 2 is not relevant to the fact that the Examiner has failed to establish that Applicant has not complied with the written description requirement. In

order to satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. According to M.P.E.P. § 2163, a description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption. The Examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. In this instance, the Examiner has not presented any evidence that the skilled artisan would not recognize in Applicant's disclosure a description of the invention defined by claims 3 and 4. In fact the Examiner specifically identifies support for aspects of claims 1, 3 and 4 in various ones of Applicant's Figures. In addition, Applicant has specifically pointed the Examiner to portions of Applicant's disclosure that provided support for claims 3 and 4. Accordingly, the Examiner has failed to establish that Applicant's disclosure does not comply with the written description requirement.

In view of the above, the § 112(1) rejection of claims 3-4 is improper and Applicant requests that it be withdrawn.

Applicant respectfully traverses the § 112(2) rejection of claim 5 because claim 5 does further limit claim 1. Applicant submits that claim 5 contains aspects which further limit claim 1 including, for example, at least one semiconductor device present on the surface of the slab of semiconducting material. Applicant notes that the Examiner has not provide any support from the M.P.E.P. or otherwise to support the assertion that claim 5 would be indefinite if "it fails to further limit the trench isolation structure, recited in claim 1." Applicant submits that claim 5 at best could be objected to under 37 CFR 1.75(c) and/or the Examiner could request that claim 5 be rewritten in independent form. *See, e.g.,* M.P.E.P. § 608.01(n). *See also* M.P.E.P. § 2173.05(f) (A claim which makes reference to a preceding claim to define a limitation is an acceptable claim construction which should not necessarily be rejected as improper or confusing under 35 U.S.C. 112, second paragraph.") Accordingly, the § 112(2) rejection of claim 5 is improper and Applicant requests that it be withdrawn. In an effort to facilitate prosecution and to avoid

an appeal, Applicant would be willing to amended claim 5 to clearly recite that claim 5 is an independent claim.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the attorney overseeing the application file, Peter Zawilski, of NXP Corporation at (408) 474-9063.

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